



**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/160,824	09/25/98	CHAN T	97-C-108

LISA K JORGENSON
STMICROELETRONICS
1310 ELECTRONICS DRIVE
MAIL STOP 2346
CARROLLTON TX 75006

MM91/1024

EXAMINER

DICKEY, T

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 10/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/160,824

Applicant(s)

Chan et al.

Examiner

Thomas L Dickey

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 1998 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 21 6) ☐ Other:

Art Unit: 2826

DETAILED ACTION

Election/Restriction

1. Applicant's election without traverse of Group I, claims 1-19 in Paper No. 4 is acknowledged.

Oath/Declaration

2. The oath/declaration filed on 09/25/98 is acceptable.

Drawings

3. The drawings are objected to by the PTO Draftsperson for the reasons noted on the attached Notice of Draftsperson's Patent Drawing Review, form PTO-948.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, in claims 12 and 19, the first and second chip "profiles" and the relationship of said "profiles" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Priority

4. Applicants have made no claim for priority.

Information Disclosure Statement

5. The Information Disclosure Statement filed on 05/26/99 has been considered. Appropriate correction is required.

Art Unit: 2826

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 12 and 19 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The term "profile," used in these claims, is not self-defining, is not defined in the application, nor is it a term of art in the art of stacked integrated circuit chip applications.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1,4,10,11,13,16, and 18 are rejected under 35 U.S.C. 102(a) as being anticipated by Ma et al. (5,677,567).

Ma et al. discloses a chip assembly comprising a first integrated circuit chip 702 having an active face including a central processing unit; and a second integrated circuit chip 704 mounted on, and electrically connected to, the active face of the first integrated circuit, and a third integrated circuit chip 706 adjacent the second integrated circuit chip

Art Unit: 2826

704 wherein the second integrated circuit chip 704 adds functionality, *in the form of memory*, to the central processing unit of the first integrated circuit 702, the third integrated circuit chip 706 adds further functionality to the integrated circuit microprocessor, and the electrical connection between the first integrated circuit chip 702 and the second integrated circuit chip 704 is by using a **bonding layer 708** to provide a **direct connection of metalizations** (712, 722, 726, and 732) that are **integral with the active faces** of the first 702 and second 704 chips. Note figure 7 and lines 40-67 of Ma et al. Note also that neither the instant claims nor the specification define the "bonding layer" (Ma et al's part 708, referred to by Ma et al. as a "lead frame") as anything more than a separate conductive layer between the chips which facilitates their bonding.

Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. Claims 2,3,14, 5-9,15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (5,677,567).

Ma et al. discloses a chip assembly with all the limitations of these claims except that the central processing unit comprise either a digital signal processor or a field programmable gate array, the memory comprise one of cache, DRAM, SRAM, FLASH, or that the second integrated circuit chip comprise an analog-to-digital converter. Note fig-

Art Unit: 2826

ure 7 and lines 40-67 of Ma et al. However, DSP and SPGA are well known circuits for a CPU chip, likewise cache, DRAM, SRAM, and FLASH are well known types of memory chips, and A-D converters are commonly put in small, auxiliary chips such as the second integrated circuit chip. Therefore, it would have been obvious to a person having skill in the art to replace the circuits of Ma et al.'s chip assembly with the circuits such as DSP, SPGA, cache, DRAM, SRAM, FLASH, and A-D converters in order provide a practical use for Ma et al.'s chip assembly.

B. Claims 12 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (5,677,567) in view of Raad (5,869,895).

Ma et al. discloses a chip assembly with all the limitations of these claims except that the profile (here assumed to be the width and breadth of the active surface) of the second integrated circuit chip is less than the profile of the first integrated circuit chip. However, Raad discloses a memory array stacked on a CPU chip with second integrated circuit chips 103 over a first integrated circuit chip 101 where the length and breadth of the second integrated circuit chips 103 is less than the length and breadth of the first integrated circuit chip. Note figure 1 of Raad.

Therefore, it would have been obvious to a person having skill in the art to replace the generally disclosed second integrated circuit chip of Ma et al.'s chip assembly with the second integrated circuit chip having a smaller "profile" such as taught by Raad in order to have the capacity to place more than one second integrated circuit chip on a

Art Unit: 2826

first integrated circuit chip to thus provide better flexibility in circuit design, especially the ability to place multiple memory chips on a single CPU.

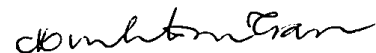
Conclusion

8. Papers related to this application may be submitted to Technology Center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 3-C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2826 Fax Center number is (703) 308-7722 and 308-7724. The Group 2800 Fax Center is to be used only for papers related to Group 2800 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to Thomas Dickey whose telephone number is **(703) 308-0980**. The Examiner is in the Office generally between the hours of 8:00 AM to 5:00 PM (Eastern Standard Time) Monday through Friday.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**.

TLD
10/2001



Minh Loan Tran
Primary Examiner